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THE
ONTARIO WATER RESOURCES
COMMISSION
WATER POLLUTION SURVEY
of the
CITY OF GUELPH
COUNTY OF WELLINGTON

CITY OF GUELPH - 1968
COUNTY OF WELLINGTON

TD
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.G84
1968
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1968

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Report on a water pollution
survey of the city of Guelph,
county of Wellington.

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R E P O R T

on a

WATER POLLUTION SURVEY

of the

CITY OF GUELPH

County of Wellington

Division of Sanitary Engineering

1968

R E P O R T

ONTARIO WATER RESOURCES COMMISSION

A water pollution survey of the City of Guelph was carried out on August 1, 2 and 29, 1968. The purpose of the survey was to determine if the city's storm sewer system was carrying pollutant materials.

Sewage waste from the city is directed to sanitary and combined sewers and is treated in a 6 MGD sewage treatment plant.

Of 61 storm sewer outfalls inspected, fourteen were noted to be discharging material to the Speed and Eramosa Rivers. A total of nineteen chemical samples and four bacteriological samples were obtained from the above storm sewers while a total of seven chemical samples were obtained from the Speed and Eramosa Rivers and a tributary to the Speed River.

SAMPLE ANALYSES

Chemical

The results and location of the samples obtained during the inspection are appended along with an explanation of the significance of the results. Of the 21 locations, inspected during the survey, two sample points numbers 17 and 20 displayed high BOD and suspended solids concentrations.

In addition the ABS concentration at sample location 17 was very high.

Bacteriological

At sample locations 15, 17 and 20 the bacteriological quality of the waste was above this Commission's objective of 2,400 coliforms per 100 ml as well as faecal coliforms being present. Faecal matter was noted in the discharge from the storm sewer at sample location 17 on the August 2, 1968 inspection.

DISCUSSION

It would appear from the samples obtained during the above survey that the majority of the storm sewers in Guelph are not polluting the Speed and Eramosa Rivers to a significant degree. The chemical and bacteriological results from sample locations 15, located on George Street, 17, located at the end of London Street and 20, located at the west culvert on Speedvale Road, indicate that polluting materials are gaining access to the Speed and Eramosa Rivers at these points. An inspection of the storm sewers discharging at the above locations should be carried out in order to find and remove the sources of pollution.

It should be noted that the above survey was carried out during dry weather conditions and therefore the remaining

storm sewers which were not discharging during this investigation should be re-examined during wet periods of the year to determine if polluted materials are being discharged to the area watercourses.

RECOMMENDATIONS

It is recommended that the City of Guelph locate and eliminate the pollution in the storm sewers discharging to the Speed and Eramosa Rivers.

Prepared by:


W.B. Pett,
Technician,
Division of Sanitary Engineering.

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POLLUTION SURVEY - CITY OF GUELPH

<u>SAMPLE NO.</u>	<u>DATE</u>	<u>LOCATION</u>	<u>BOD</u>	<u>SUSPENDED SOLIDS</u>	<u>ABS</u>	<u>PHENOLS</u>	<u>BACTERIOLOGICAL</u>	
							<u>COLIFORM ORGANISMS</u>	<u>FAECAL</u>
1	AUGUST 1/68	CREEK SOUTH OF PAISLEY RD.	0.8	25	0.0	-		
2	AUGUST 1/68	CREEK DOWNSTREAM FROM 1	2.2	22	0.1	-		
3	AUGUST 1/68	CULVERT END OF CHADWICK ST.	0.5	3	0.1	-		
4	AUGUST 1/68	DAM DOWNSTREAM FROM CHADWICK ST.	3.6	21	0.1	-		
5	AUGUST 1/68	BRIDGE DOWNSTREAM FROM 4	3.6	40	0.1	-		
6	AUGUST 1/68	SPEED RIVER UP- STREAM FROM SEWAGE TREATMENT PLANT	2.0	17	0.1	-		
7	AUGUST 1/68	CULVERT END OF HOLIDAY ST.	0.8	4	0.1	-		
8	AUGUST 1/68	CULVERT BEHIND CANADIAN TIRE CORP. ON WELLINGTON ST.	0.5	1	0.0	-		
9	AUGUST 1/68	CULVERT BEHIND GUELPH PLUMBING AND HEATING ON WYNDHAM ST.	1.3	17	0.0	-		
10	AUGUST 1/68	CULVERT OFF WYNDHAM ST.	1.0	1	0.1	-		
11	AUGUST 1/68	CULVERT END OF BOULT AVE.	2.8	2	0.0	-		
12	AUGUST 1/68	CULVERT END OF BROCKVILLE ST.	2.1	3	0.1	0.0		
13	AUGUST 1/68	CULVERT END OF KINGSMILL AVE.	0.5	1	0.0	-		
14	AUGUST 1/68	ERAMOSA RIVER AT CPR BRIDGE	1.1	3	0.0	-		
	AUGUST 29/68	ERAMOSA RIVER AT CPR BRIDGE	2.2	3	0.0	-		

POLLUTION SURVEY - CITY OF GUELPH CONT'D

<u>SAMPLE NO.</u>	<u>DATE</u>	<u>LOCATION</u>	<u>BOD</u>	<u>SUSPENDED SOLIDS</u>	<u>ABS</u>	<u>PHENOLS</u>	<u>BACTERIOLOGICAL</u> <u>COLIFORM ORGANISMS</u>	<u>FAECAL</u>
15	AUGUST 29/68	CULVERT ON GRANGE ST.	0.5	2	0.1	3		
	"	CULVERT ON GRANGE ST.	1.4	2	0.0	-	120,000	214
16	AUGUST 1/68	CULVERT OFF REEVE ST.	1.0	7	0.0	6		
	AUGUST 29/68	"	1.3	1	0.1	-	1,500	120
17	AUGUST 3/68	CULVERT END OF LONDON RD.	1.70	133	13.2	6		
	AUGUST 29/68	"	2.6	2	0.2	-		
18	AUGUST 3/68	CULVERT END OF EARL ST.	0.5	6	0.0	-		
19	AUGUST 3/68	CULVERT SPEED-VALE RD. EAST SIDE OF RIVER	0.4	6	0.0	-		
	AUGUST 29/68	"	3.0	7	0.0	-	4,800	300
20	AUGUST 3/68	CULVERT SPEED-VALE RD. WEST SIDE OF RIVER	200	70	0.1	-		
	AUGUST 29/68	"	35.0	119	0.1	-	850,000	6,150,000
21	AUGUST 3/68	SPEED RIVER UP-STREAM FROM TOWN	0.7	7	0.0	-		

APPENDIX I

SIGNIFICANCE OF LABORATORY ANALYSES

Bacteriological Examination

The presence of coliforms indicates pollution from human or animal excrement, or from some non-faecal forms. The objectives for surface water quality in Ontario is a maximum of 2400 organisms per 100 millilitres.

The OWRC Laboratories employ the Membrane Filter (MF) technique of examination to obtain a direct enumeration of coliform organisms. The Department of Health Laboratories use the Most Probable Member (MPN) enumeration and coliform counts are reported as Total Coliform Organisms (TC) and Faecal Coliform Organisms (FC).

Sanitary Chemical Analyses

Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand is reported in parts per million (PPM) and is an indicated of the amount of oxygen required for the stabilization of decomposable organic or chemical matter in water. The completion of the laboratory test required five days, under the controlled incubation temperature of 20° Centigrade.

The OWRC objective for surface water quality is an upper limit of four (4) ppm.

Solids

The value for solids, expressed in parts per million, is the sum of the values for the suspended and the dissolved matter in the water. The concentration of suspended solids is generally

the most significant of the solids analyses with regard to surface water quality. The effects of suspended solids in water are reflected in difficulties associated with water purification, decomposition in streams and injury to the habitat of fish.

Nitrogen

Ammonia Nitrogen or sometimes called free ammonia is the insoluble product in the decomposition of nitrogenous organic matter. It is also formed when nitrates and nitrites are reduced to ammonia either biologically or chemically. Some small amounts of ammonia, too, may be swept out of the atmosphere by rain water.

The following values may be of general significance in appraising free ammonia content: Low 0.015 to 0.03 ppm; moderate 0.03 to 0.10 ppm; high 0.10 or greater.

Total Kjeldahl is a measure of the total nitrogenous matter present except that measured as nitrite and nitrate nitrogens. The Total Kjeldahl less the Ammonia Nitrogen measures the organic nitrogen present. Ammonia and organic nitrogen determinations are important in determining the availability of nitrogen for biological utilization. The normal range for Total Kjeldahl would be 0.1 to 0.5 ppm.

Nitrite Nitrogen

Nitrite is usually an intermediate oxidation of ammonia. The significance of nitrites, therefore, varies with their amount, sources, and relation to other constituents of the

sample, notably the relative magnitude of ammonia and nitrite present. Since nitrite is rapidly and easily converted to nitrate, its presence in concentrations greater than a few thousandths of a part per million is generally indicative of active biological processes in the water.

Nitrate Nitrogen

Nitrate is the end product of aerobic decomposition of nitrogenous matter, and its presence carries this significance. Nitrate concentration is of particular interest in relation to the other forms of nitrogen that may be present in the sample. Nitrates occur in the crust of the earth in many places and are a source of its fertility.

The following ranges in concentration may be used as a guide: low less than 0.1 ppm; moderate 0.1 to 1.0 ppm; high greater than 1.0 ppm.

Anionic Detergents as ABS

The presence of anionic detergents as ABS is an indication that domestic waste is present.

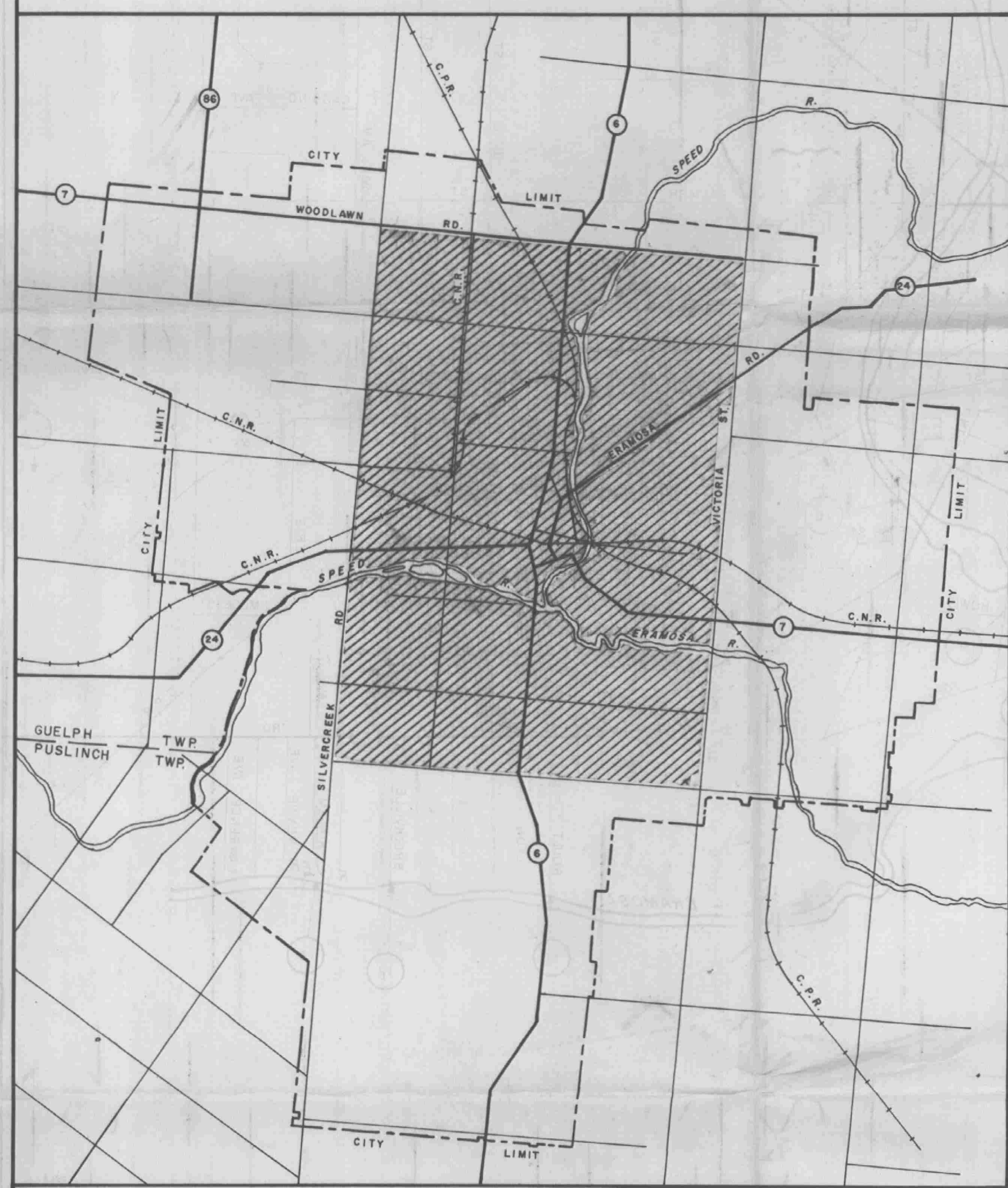
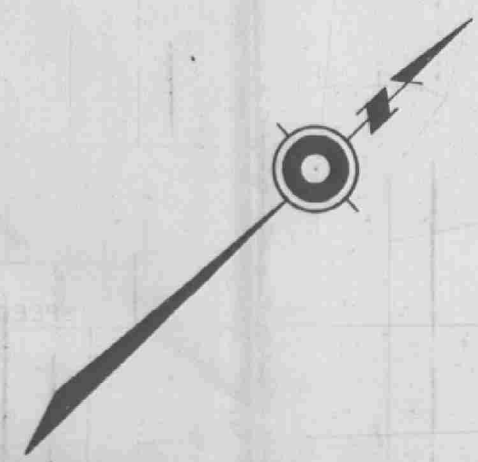
Phenols

The presence of phenol or phenolic equivalents is generally associated with discharges containing petroleum products, or with wastes from some industries. It is generally conceded that adequate protection of surface waters will be provided if the concentration of phenols in waste discharges does not exceed

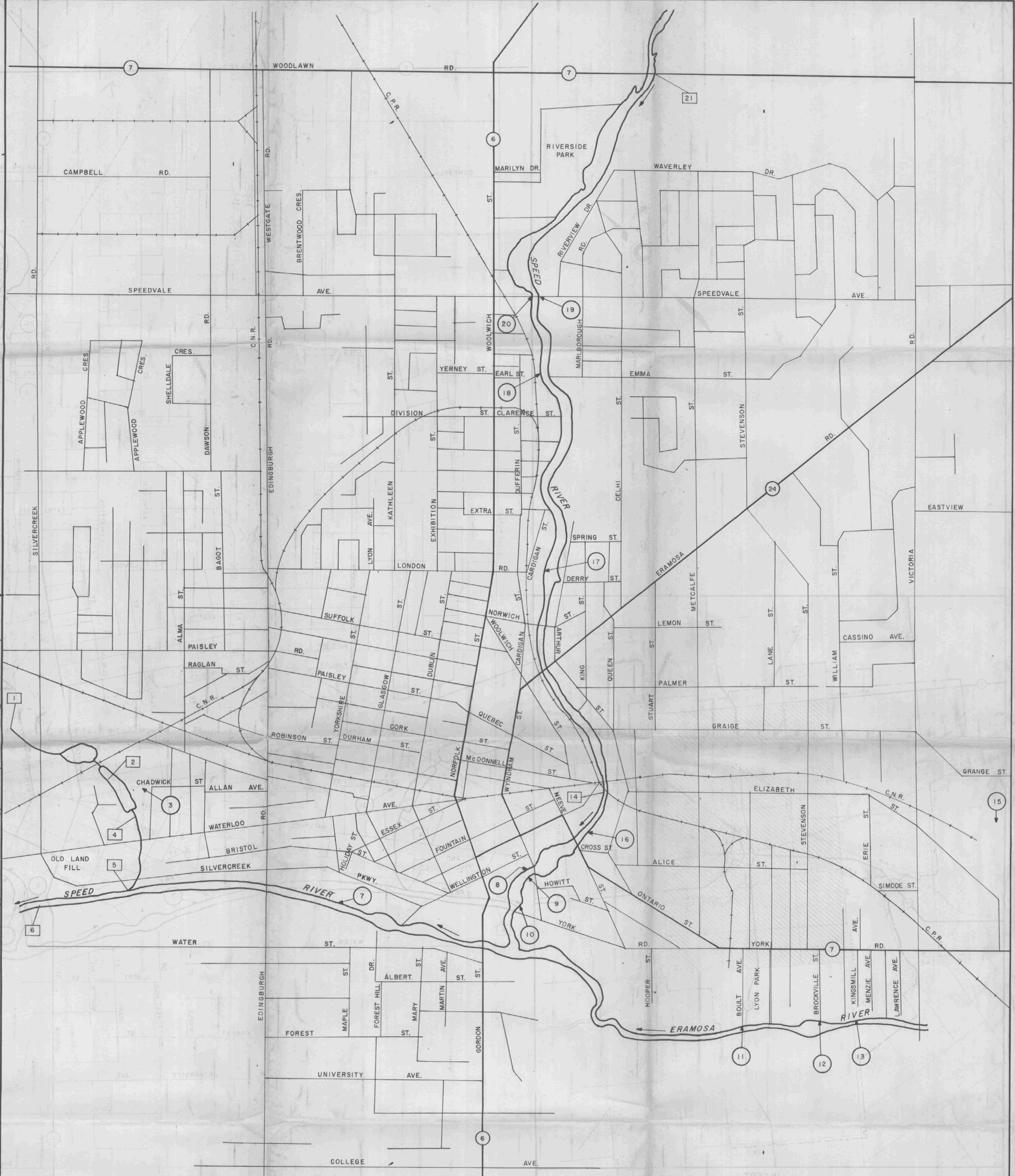
20 parts per billion (ppb). Phenolic type waste can cause objectionable conditions in water supplies and might taint the flesh of fish.

Iron

Water for domestic use should contain less than 0.3 parts per million of iron in order to avoid objectionable tastes, staining and sediment formation. Iron concentrations of not greater than 17 parts per million in waste discharges should permit adequate protection of surface waters.



INSERT
SCALE: 1 IN. = 4000 FT. APPROX.



- LEGEND**
- 6 - STREAM SAMPLE
 - 7 - STORM SEWER SAMPLE